

What is claimed is:

1. A two-stroke internal combustion engine including an engine for a portable handheld work apparatus, the internal combustion engine comprising:

a cylinder having a cylinder wall;

5 a piston mounted in said cylinder to undergo a reciprocating movement along a stroke path during operation of said engine;

said cylinder and said piston conjointly delimiting a combustion chamber;

a crankcase connected to said cylinder;

10 a crankshaft rotatably mounted in said crankcase;

a connecting rod connecting said piston to said crankshaft to permit said piston to drive said crankshaft as said piston reciprocates in said cylinder;

15 an outlet for conducting exhaust gases away from said combustion chamber;

at least one transfer channel for connecting said combustion chamber to said crankcase at predetermined positions of said piston;

20 an air channel for supplying combustion air into said crankcase;

a throttle element mounted in said air channel;

a separate fuel inlet in said crankcase;

a fuel metering system for metering fuel into said separate fuel inlet; and,

25 said fuel metering system including metering means for metering fuel in dependence upon at least one of the position of said throttle element and the rpm of said engine.

2. The two-stroke engine of claim 1, said fuel metering system including a fuel-opening element defining a fuel opening and a control device operatively connected to said fuel-opening element.

3. The two-stroke engine of claim 2, said control device including a regulator needle for coacting with said fuel-opening element to control the free cross section of said fuel opening.

4. The two-stroke engine of claim 3, said control device including coupling means for coupling the position of said regulator needle to said throttle element.

5. The two-stroke engine of claim 4, wherein said throttle element is a throttle flap having throttle shaft for pivotally mounting said throttle flap in said air channel; and, said control device including a control cross section formed in said throttle shaft for acting on said regulator needle and said control cross section deviating from a circular form.

6. The two-stroke engine of claim 1, wherein said fuel metering system includes a electromagnetic valve.

7. The two-stroke engine of claim 2, further comprising a fuel channel connected to said separate fuel inlet; and, said fuel metering system being disposed in said fuel channel and said fuel opening of said fuel-opening element opening into said fuel channel.

8. The two-stroke engine of claim 7, said fuel channel having an

air inlet upstream of said fuel metering system for admitting air into said fuel channel as a carrier medium for the fuel metered by said fuel metering system.

9. The two-stroke engine of claim 8, further comprising a membrane valve for connecting said separate fuel inlet to said crankcase.

10. The two-stroke engine of claim 8, further comprising a check valve for connecting said separate fuel inlet to said crankcase.

11. The two-stroke engine of claim 1, wherein said separate fuel inlet is slot controlled.

12. The two-stroke engine of claim 1, further comprising an air inlet arranged on said cylinder in the region of said cylinder; said air channel opening into said air inlet; and, said piston having a piston window and said air inlet communicating via said piston window and said transfer channel with said crankcase when said piston is in predetermined positions.

13. The two-stroke engine of claim 12, wherein said piston window extends over at least 10% of the periphery of said piston.

14. The two-stroke engine of claim 12, wherein said piston window extends over more than 40% of the periphery of said piston.

15. The two-stroke engine of claim 12, wherein said air channel opens directly into said crankcase at predetermined positions of said piston.

16. The two-stroke engine of claim 1, wherein said portable handheld work apparatus is one of a motor-driven chain saw and a cutoff machine.

17. A method for operating a two-stroke internal combustion engine including an engine for a portable handheld work apparatus, the internal combustion engine including a cylinder having a cylinder wall; a piston mounted in said cylinder to
5 undergo a reciprocating movement along a stroke path during operation of said engine; said cylinder and said piston conjointly delimiting a combustion chamber; a crankcase connected to said cylinder; a crankshaft rotatably mounted in said crankcase; a connecting rod connecting said piston to said
10 crankshaft to permit said piston to drive said crankshaft as said piston reciprocates in said cylinder; and, an air inlet for admitting substantially fuel-free combustion air, the method comprising the steps of:

metering fuel to said crankcase through a separate fuel
15 inlet; and,

utilizing said combustion air passed through said air inlet to prepare an air/fuel mixture in said crankcase with said combustion air supplied through said air inlet.

18. The method of claim 17, wherein said fuel is supplied to said crankcase with air as a carrier medium.

19. The method of claim 16, wherein 0% to 20% of the total combustion air is supplied through said fuel inlet to said two-stroke engine.